

If these views are correct, and they certainly involve no dislocation of the principles of deductive and analogical reasoning, in connection with the recent accepted views of the function of the sympathetic, they become most important not only in explaining physiological and pathological phenomena of the kidney, but also in their relation to therapeutics, while they account most satisfactorily for certain recognized phenomena in the secretion of urine. It would seem that their correctness must rest entirely upon that of the observations. If the facts be correctly observed, it would appear to me that the view is at least a legitimate conclusion, though, in the uncertainty of our science, it may not be the only one.

If, then, so much depends upon the accuracy of observation, it is exceedingly important that other observers should go over them, to confirm if possible, or to deny if need be. To this end, it is hoped, these efforts contribute.

It can scarcely be objected to the conclusions drawn that the facts have not all been demonstrated in a single species; that while the nerves and ganglia have been found in the connective and submucous tissue in the notch of the pig's kidney, and in the same situation in the child, they have not been found in connection with the tubular structure of these kidneys, but in those of the frog and newt. The elements of general physiology, however, show most conclusively that except there be some fundamental difference in function, structural arrangements which hold good in the organs of one animal hold good in the corresponding organ of another. Now, we not only have no such fundamental difference in the function of the kidney of man, the frog, and newt, but the structure, so far as the acknowledged secreting elements are concerned, is almost identical; and the arrangement of the tubules and capillaries in the organs of these lower animals has been of invaluable service in determining the true anatomy of the human kidney. With equal propriety, then, may the arrangement and the distribution of the nerves in the same organs be used to determine more delicate points in the anatomy of the human kidney.

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ART. XII.—*Fracture of the Neck of Femur; Treatment by Means of Extension with Weights, applied both in the direction of Axis of Limb, and also Laterally in Axis of Neck; Recovery without Shortening or other Deformity.* By G. W. PHILLIPS, M. D., Dixon, Illinois. (With a wood-cut.)

AUG. 10th, 1867, Mr. S., aged 45, of good constitution, was thrown from a load of hay, striking his left hip upon the hard road. As he lay in bed upon his back the shape of the hip was seen to be altered; region of trochanter flattened, the contour of the hip being fuller on the posterior-superior part. Position of the limb was nearly natural with the exception of the toes pointing directly forwards; shortening of one-half or three-fourths of an inch. Contusion slight. The trochanter, as the patient was not very fleshy, could be easily felt depressed and resting upon the posterior-superior edge of the acetabulum and body of the ischium. The least attempt to move the limb caused great pain. Upon putting him under chloroform, and making extension, the limb was readily brought to

its natural length, a distinct crepitus being heard at that moment. Upon withdrawing the extension, the shortening and unnatural contour of the hip returned, no crepitus being noticed as the limb shortened. By adducting the thigh, and flexing it across the abdomen, making the pelvis a fulcrum on which to depress the femur, then rotating the limb, there was distinct crepitus; this movement was repeated several times, but crepitus was not always heard. During the progress of the case but little swelling occurred. At the termination of the treatment, the entire joint was a little enlarged but uniform.

There was evidently a fracture in the region of the hip-joint, either of the neck of femur; "fracture through the trochanter major and base of the neck of femur," as this form of fracture is called by Hamilton; fracture through the base of acetabulum; or of the rim of acetabulum. As before remarked, the patient, not being fleshy, and there being no swelling from effusion, the hip could be as easily examined as the sound one. No prominence could be felt except the trochanter, as would have been the case if it had been a "fracture through the trochanter major and base of neck of femur."

Dr. Hamilton says, that in cases of "fracture through the base of acetabulum, in which the head of the femur is driven through into the cavity of the pelvis, crepitus is more uniformly present than in fractures of neck of femur; and it is especially felt while the limb is being extended, or while it is again shortening, and not so much in flexion and rotation." In this case, crepitus was not felt until extension was complete, and not felt while the limb was again shortening, and was also felt in flexion combined with rotation.

The evidences of local injury were too slight to have supposed that the base of acetabulum was fractured. In fracture of the rim of the acetabulum, according to Hamilton, the "causes are generally the same as those which produce dislocation of the hip; in most instances the violence has been greater than in the case of dislocation." "The symptoms are first such as indicate a dislocation, to which may be added crepitus and difficulty, if not impossibility, of retaining the head of the femur in its place, when reduced. The crepitus is discovered the moment we begin to move the limb, and this will aid us to distinguish it from fracture of the neck of the femur, accompanied with much displacement; since, in the latter case, the crepitus is not felt, usually, until the extension is complete, and the fragments are again brought in apposition."

As the principal point of interest in this case is the treatment, the question need not be considered as to whether this was a case of intra- or extra-capsular fracture, as the method of treatment is adapted to either form.

In order that the surgeon may intelligently apply mechanical means, so as to bring the surfaces of the fracture in contact, and keep them so, he must clearly understand the direction in which the muscles exert their contractile force.

In fracture of the cervix femoris, one set of muscles arising from the pelvis and lower portion of spine, and inserted into the femoral fragment, and to the leg below the knee, the general direction of which is in the line of the axis of femur, draw this fragment upward and backward, shortening the limb; another set of muscles, also taking their origin from the pelvis, the fibres of which run in the direction of the axis of the neck of femur, and inserted into the great trochanter and upper portion of femur, draw it inwards, thus shortening the neck. In order to bring the surfaces

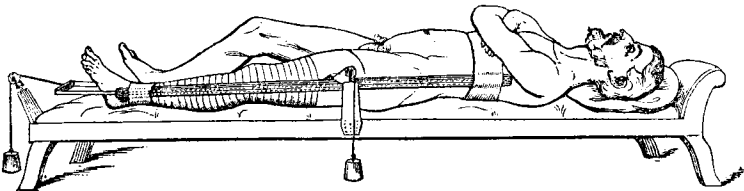
of the fracture in contact, and keep them in place, there are three indications to be fulfilled. First, to restore the limb to its natural length. Second, to restore the cervix to its natural length. Third, to prevent motion of the surfaces of the fracture upon each other.

The first indication was met by employing adhesive plasters, applied to the limb, a cord being attached to a loop, and passed over a pulley, and weight attached. The counter-extension was the weight of the body, increased by elevating the foot of bedstead five inches.

The second indication was accomplished by fastening a broad band, made of thick, firm cloth, around the upper part of the thigh; to this was attached, on the outer side of limb, a cord passing over a pulley in a block fastened to the bed rail, and weight attached. The position of block with pulley was such, that the extending force drew at right angles with the axis of femur outward, and a little upwards, thus restoring the neck of femur to its natural length and position. The counter-extension was, of course, the weight of the body.

The third indication was met by the use of a broad thick splint, extending from the axilla to the sole of the foot. This was fastened to the chest by a broad band, and to the limb by other bands, the splint being thickly padded at upper and lower part, so as not to press upon the trochanter.

The accompanying drawing shows the apparatus as applied. The lateral extension not only restored the neck to its natural length and position,



but, by putting the muscles on the stretch that lie in contact with the joint, served to steady the broken ends of the bones upon each other. That this lateral extension restored the neck to its natural length and position could easily be seen; for, when applied, the trochanter could be felt to move outward, and the natural contour of the hip to become restored; if left off, the trochanter became depressed and hip flattened.

The weight applied to the limb to produce extension for the first three weeks varied from twenty to twenty-five pounds; after that time fifteen pounds were found to be sufficient to keep the limb to its natural length. The weight for the lateral extension was nine pounds. The extension, both in direction of axis of limb, and laterally, was kept up for sixty days, then removed, but patient kept in bed on his back three weeks longer before he was allowed to go upon crutches.

On November 25th, one hundred and seven days since the occurrence of the injury, and twenty-seven since he commenced the use of crutches, I found, by careful measurement, no difference in the length of the limbs, and the distance from the trochanter to the anterior superior spine of ilium to be the same on both sides. Soon after this Mr. S. left for his home in Glasgow, Scotland. I have since learned that, after several months had elapsed, he had obtained a good use of his limb.